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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/762,690

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Darwin V. Ellis

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12/13/2005

SCHLUMBERGER-DOLL RESEARCH
36 OLD QUARRY ROAD
RIDGEFIELD, CT 06877-4108

EXAMINER

TAYLOR, VICTOR J

ART UNIT

PAPER NUMBER

2863

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/762,690	Applicant(s) ELLIS ET AL.	
	Examiner Victor J. Taylor	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 6, 7 and 10-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 6-19 is/are rejected.
- 7) ☒ Claim(s) 2-5, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6</u> | 6) <input checked="" type="checkbox"/> Other: <u>Office Action</u> . |

DETAILED ACTION***Drawings***

1. The drawings are objected to because minor informalities found in the hand drawn numbering and lettering which does not meet the requirements for formal drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Please note that each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 2-5, and 8-9 are objected to because of the following informalities:

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I. Claim 2 recites a long spacing and has wording in the claim for the location requirement of "between 13 and 24 inches (33-61 centimeters)" in the claim. It is not clear if the applicant means between 13 inches or 33 centimeters and 24 inches or 61 centimeters from the gamma source. The distinction between the spacing requirements is not clear and the brackets surrounding the term of "(33-61 centimeters)" are improper in the claim structure. The comparison of 33-61 centimeters is not exactly equal to 13-24 inches wherein the length is 12.99 inches and 24.01 inches respectively. Appropriate correction is required.

II. Claim 3 recites a long spacing and has wording in the claim for the location requirement of "between 14 and 18 inches (36-46 centimeters)" in the claim. It is not clear if the applicant means between 14 inches or 36 centimeters and 18 inches or 41 centimeters from the gamma source. The distinction between the spacing requirements is not clear and the brackets surrounding the term of "(36-46 centimeters)" are improper in the claim structure. The comparison of 36-46 centimeters is not exactly equal to 14-18 inches wherein the length is 14.17 inches and 18.11 inches respectively. Appropriate correction is required.

III. Claim 4 recites a short spacing and has wording in the claim for the location requirement of "between 5 and 12 inches (13-30 centimeters)" in the claim. It is not clear if the applicant means between 5 inches or 13 centimeters and 12 inches or 30 centimeters from the gamma source. The distinction between the spacing requirements is not clear and the brackets surrounding the

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term of "(13-30 centimeters)" are improper in the claim structure. The comparison of 13-30 centimeters is not exactly equal to 5-12 inches wherein the length is 5.11 inches and 11.80 inches respectively. Appropriate correction is required.

IV. Claim 5 recites a short spacing and has wording in the claim for the location requirement of "between 6 and 8 inches (15-20 centimeters)" in the claim. It is not clear if the applicant means between 6 inches or 15 centimeters and 8 inches or 20 centimeters from the gamma source. The distinction between the spacing requirement is not clear and the brackets surrounding the term of "(15-20 centimeters)" are improper in the claim structure. The comparison of 15-20 centimeters is not exactly equal to 6-8 inches wherein the length is 5.90 inches and 7.87 inches respectively. Appropriate correction is required.

V. Claim 8 and claim 9 are objected to because of the lack of the clear antecedent basis in the claimed steps structure and for the inclusion of the bracketed material with the indefinite selection of "one or more" steps combined with the brackets (backscatter) step in claim 8 and the brackets (determined...) step in claim 9. Appropriate correction is required.

Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant.

I. Art A of Watson US 5,350,925 in class 250/269.3 is cited for the method of processing spectra data detected by the gamma ray detector of a borehole

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tool to provide borehole parameters and discloses the nuclear logging tools in lines 30-50 of column 2.

II. Art B of Case US 5,334,833 in class 250/270 is cited for the function technique for modeling nuclear tool data calculated by a convolution of density sensitivity functions 40 in figure 1 and discloses the Monte Carlo technique in lines 40-60 of column 2.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, and 6-7 and 10-19 are rejected as being unpatentable over Gzara in U.S. Patent 6,768,106 B2.

With regard to claim 1, Gzara discloses a method of determining both formation density 8 in a borehole 12 environment and a characteristic of a mud mixture surrounding a drilling tool using a logging tool 400 having a gamma ray source, and a long spacing detector and a short spacing detector in figure 7-A and figure 7-B.

a. He further discloses the steps of “developing one or more cased hole calibration relationships which utilize the differences between the scattered

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gamma rays observed by the short spacing detectors 106 and the scattered gamma rays from the formation observed by long spacing detectors 108 to determine the corrected formation density values" are disclosed in the analyzed data used to yield the formation properties as found in line 33 of column 10. He further discloses the relationships between the scattered gamma-rays using the LWD tool 100 and the long and short mounted spaced apart gamma density detectors used to collect drilling mud and formation property density data in lines 5-15 of column 10. He further discloses the computer and the computer program 320 in figure 9 used to compute the density data and uses the computer sub-program 321 to compute the bulk density of the formation in lines 20-40 of column 14.

b. He further discloses the steps of using the "cased borehole calibration relationships and scattered gamma ray measurements obtained by said long spacing detector and said short spacing detector to determine the formation density" 100 using the gamma density logging tool 400 to use the long and short gamma detected data 14 to compute the formation density 100 in figure 1 in combination with the bulk density computer program 320 in figure 9

As to claim 6, which stand rejected on the rejected base claim, wherein said logging tool further includes a backscatter detector located between said gamma ray source and said short spacing detector is disclosed in the short spacing backscatter configuration for the short detector 108 in figure 7-A.

As to claim 7, which stand rejected on the rejected base claim, wherein said gamma ray source comprises a Cesium-137 source is disclosed installed on

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the gamma tool 400 in figure 1 and disclosed as the gamma source in line 12 of column 7.

As to claim 10, which stands rejected on the rejected base claim, wherein different said calibration relationships are determined for different cement densities and one or more of determines cement density utilizing the density of the cement pumped at the surface and ultrasonic measurements disclosed in the cement casing 6 in figure 1.

As to claim 11, which stands rejected on the rejected base claim, wherein said scattered gamma ray measurements obtained by said long spacing detector and said short spacing detector are corrected for perturbations associated with completion hardware is disclosed in the ADC circuits connected to the computer and data processes in figure 7-A and the downhole computer 301 in line 65 of column 13.

As to claim 12, which stands rejected on the rejected base claim, wherein said correction is performed by identifying a region associated with said completion hardware and substituting for perturbed samples in this region an average of the values of closest good samples on either side of these perturbed samples is disclosed as the data gathered and found in the soft window count rates for the detectors long and short acquisition of density samples 335 in figure 12-E.

As to claim 13, which stands rejected on the rejected base claim, wherein said short spacing detector and said long spacing detector each have multiple energy windows 335 and count rates from lower energy windows associated with

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said detectors are ignored or underweighted with respect to higher energy windows associated with said detectors as found in the computation processes and acquisition time samples 335 in figure 12-F

As to claim 14, which stands rejected on the rejected base claim, wherein further comprising determining a maximum standoff distance between said logging tool and the formation is disclosed in the tool position and the detector location on the tool in relation to the borehole in figure 1 and defined in the computations for the quadrants in lines 28-30 of column 13.

As to claim 15, which stands rejected on the rejected base claim, wherein further comprising determining when the standoff distance between said logging tool and the formation exceeds said maximum standoff distance is determined in the computer computations and the computer program 326 in line 48 column 14.

With regard to claim 16, Gzara discloses an article of manufacture with,

a. A computer useable medium having a computer readable program code means embodied therein for determining formation density in a cased whole environment, the computer readable program code means in said article of manufacture disclosed in the computer program 320 illustrated in figure 8 using the sub-program "Spine and Ribs" which discloses the data acquisition program 315 stored on the computer memory which comprises the article of manufacture in figure 8 on line 5-60 of column 14.

b. Computer readable program means for determining formation density in a cased bore hole 6 shown in figure 1 environment using one or more cased hole calibration relationships and measurements made by a logging tool having a

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gamma ray source, a long spacing detector, and a short spacing detector is disclosed on the bore hole tool in figure 1 all elements and discloses in the schematic of figure 2 the LWD tool with the detectors and the gamma ray source and in lines 5-25 of column 7.

With regard to claim 17, Gzara discloses a computerized well logging system for determining the formation density in a cased hole environment. And,

a. A logging tool having a gamma ray source, a long spacing detector, and a short spacing detector disclosed in the LWD tool 400 in figure 1. And,

b. A computing module and/or processing circuitry, connected to said logging tool, having means for calculating formation density from gamma ray scattering measurements obtained by said long spacing detector and gamma ray scattering measurements obtained by said short spacing detector using one or more cased hole calibration relationships is disclosed in the surface instrumentation 14 in figure and in combination with the complete patent and in lines 5-65 of column 9 and column 10.

As to claim 18, which stand rejected on the rejected base claim, wherein said logging tool is suspended by a cable and a swivel allows said logging tool to rotate with respect to said cable is disclosed on the drill string which rotates the tool using the Kelly 5 rig top side in figure 1.

As to claim 19, which stand rejected on the rejected base claim, wherein said logging tool has a recommended open hole logging speed and a recommended cased hole logging speed and said recommended cased hole logging speed is at least two times slower than said recommended open hole

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logging speed is disclosed in the rotation parameters of the LWD tool and is determined by the system control 14 using the top side instruments and control station 14 in figure 1 in combination with the computer and computer program 320 in line 18 of column 14.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor J. Taylor whose telephone number is 571-272-2281. The examiner can normally be reached on 8:00 to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Barlow can be reached on 571-272-2863. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

V. Taylor


7 December 2005.


John Barlow
Supervisory Patent Examiner
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